

## In Vitro Inhibitory Effect of Recombinant Human Calprotectin on Nalm6 Leukemia Cell Line

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### Abstract

**Background & purpose:** In evaluating new drugs for the treatment of various types of cancer, investigations have been made to discover a variety of anti-tumor compounds with less side effects on normal cells. Investigations have shown that the heterodimers S100A8 and S100A9 inhibit the enzyme casein kinase 2 and then prevent the activation of the E7 oncoprotein. Therefore, the aim of this study was to evaluate the effect of calprotectin as an antitumor compound on the Nalm6 (B cell precursor leukemia cell line).

**Materials & methods:** Transformation of genes encoding S100A8 and S100A9 human, designed in the pQE32 plasmid, was performed by the thermal shock method into E. coli M15 bacteria. After bacterial growth in LB medium, the expression of two S100A8 and S100A9 subunits, the solubility of the protein by SDS-PAGE method was determined. Finally, the S100A8 / A9 complex was equally placed in the microtube. In the next step, the cytotoxic effects of calprotectin produced on the Nalm6 cell line were evaluated using the wst1 test. Then, the apoptosis in these cells was measured using flow cytometry methods with Annexin-V coloration.

**Results:** In the current study, the results showed that the cytotoxic effects of Calprotectin are time and concentration- dependent. Therefore, it can reduce the tumor expression and had a beneficial effect by induced apoptosis in Nalm6 cell line.

**Conclusion:** Calprotectin has an anti-tumor effect on the Nalm6 cell line by increasing apoptosis.

**Keywords:** Calprotectin; Nalm6; S100A8; S100A9; acute lymphoblastic leukemia; pQE32 plasmid.

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